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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,986	01/28/2002	Masako Takayama	107439-00063	6687

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EXAMINER
DUONG, THANH P

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/055,986	TAKAYAMA ET AL.	
	Examiner	Art Unit	
	Tom P Duong	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *15-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/28/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-14, drawn to a device for carbon monoxide removal by selection oxidation, classified in class 422, subclass 170.

II. Claims 15-19, drawn to a carbon monoxide selective oxidation removing method, classified in class 423, subclass 213.7.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process of removing carbon monoxide can be done by wet scrubbing process such as absorber or from an alkaline leaching solution other than a carbon monoxide selective oxidation catalyst layers.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. George Oram on December 27, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims (1-14). Affirmation of this election must be made by applicant in replying to this Office action. Claims 15-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto (6,634,168). Yamamoto discloses a device (10, 12) for carbon monoxide (Abstract) removal by selective oxidation, comprising: a carbon monoxide selective oxidation catalyst layers (10,12) each containing a carbon monoxide selective oxidation catalyst (Abstract) which reduces the concentration of carbon monoxide contained in a gas by oxidation, wherein said carbon monoxide selective oxidation catalyst layers are serially connected (Fig. 1) to each other, and the amount of metallic catalyst contained in each of said carbon monoxide selective oxidation catalyst layers is larger than the amount in the preceding carbon monoxide selective oxidation catalyst layer from the upstream side to the downstream side (Abstract) in the flow direction of said gas.

2. Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Iwaoka et al. (4,175,107). Iwaoka discloses a device (Fig. 3) for carbon monoxide removal by selective oxidation, comprising: carbon monoxide selective oxidation catalyst layers (12, 17) each containing a carbon monoxide selective oxidation catalyst (Col. 4, lines 41-49) which reduces the concentration of carbon monoxide contained in a gas by oxidation (Col. 4, lines 15-20), wherein said carbon monoxide selective oxidation catalyst layers

are serially connected to each other (Fig. 3), and the length of each of said carbon monoxide selective oxidation catalyst layer is longer than the length of the preceding carbon monoxide selective oxidation catalyst layer from the upstream side to the downstream side in the flow direction of said gas (Col. 3, lines 13-20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil et al. (5,874,051) in view of Yamamoto (6,634,1680 and Takeuchi et al. (4,774,217).

Regarding claims 1-2 and 7, Heil discloses a carbon device (Fig. 1) for carbon monoxide removal by selective oxidation (Abstract) comprising: an air introducing unit (4), and a gas temperature controlling unit (7), wherein said air introducing unit and said gas temperature controlling unit are disposed at the upstream side of said carbon monoxide selective oxidation catalyst layer in the flow direction of said gas (Fig. 1); a carbon monoxide selective oxidation catalyst layers (5) each containing a carbon monoxide selective oxidation catalyst or precious metal (Col. 3, lines 38-40) which reduces the concentration of carbon monoxide contained in a gas by oxidation (Col. 3, lines 23-27), wherein said carbon monoxide selective oxidation catalyst layers are

serially connected (Fig. 1) to each other. Heil fails to disclose the amount of metallic catalyst contained in each of said carbon monoxide selective oxidation catalyst layers is larger than the amount in the preceding carbon monoxide selective oxidation catalyst layer from the upstream side to the downstream side in the flow direction of said gas. Yamamoto teaches the downstream catalyst (12) contains a larger catalyst amount (Col. 2, lines 24-35) than the upstream catalyst (10) to sufficiently oxidize CO (Col. 1, lines 5-10) and remove even slightly oxidizable hydrocarbons (Col 2, lines 55-60). Takeuchi also teaches it is desirable to provide a higher catalyst density on the downstream side than the upstream side (Col. 3, lines 25-30) to minimize the deactivating of the catalyst substance on the downstream side or to maintain the catalytic activity on the downstream side (Col. 6, lines 53-63). Thus, it would have been obvious in view of Yamamoto and Takeuchi to one having ordinary skill in the art to modify the apparatus of Heil with a catalyst layer on the downstream side having a larger catalyst amount than on the preceding catalyst layer as taught by Yamamoto and Takeuchi in order to effectively oxidized the CO and/or remove oxidizable hydrocarbons. Regarding claims 3-4, Heil shows the reactor chamber (2) is provided with a catalyst layers (5) connected in series. Regarding claims 5 and 6, it is conventional to provide a second carbon monoxide selection oxidation catalyst layer arranged in parallel and it would have been obvious to do so here to allow the oxidize layers and/or beds to continuously purifying the CO while the other is being regenerated (See USPN 6,309,768).

4. Claims 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil et al. (5,874,051) in view of Iwaoka '107 and Takahata et al. '610. Regarding claims 8-11 and 14, Heil discloses a carbon device (Fig. 1) for carbon monoxide removal by selective oxidation (Abstract) comprising: an air introducing unit (4), and a gas temperature controlling unit (7), wherein said air introducing unit and said gas temperature controlling unit are disposed at the upstream side of said carbon monoxide selective oxidation catalyst layer in the flow direction of said gas (Fig. 1); a carbon monoxide selective oxidation catalyst layers (5) each containing a carbon monoxide selective oxidation catalyst or precious metal (Col. 3, lines 38-40) which reduces the concentration of carbon monoxide contained in a gas by oxidation (Col. 3, lines 23-27), wherein said carbon monoxide selective oxidation catalyst layers are serially connected (Fig. 1) to each other. Heil fails to disclose the length of each of said carbon monoxide selective oxidation catalyst layer is longer than the length of the preceding carbon monoxide selective oxidation catalyst layer from the upstream side to the downstream side in the flow direction of said gas. Iwaoka '107 teaches the second catalyst layer 17 with a longer length located downstream of the first catalytic layer 12 (Col. 3, lines 14-20) to provide a high purification ratio (Col. 1, lines 57-68) and prevent excessive temperature rise in the catalyst layers. Takahata '610 also teaches the importance of providing a upstream catalyst layer with a shorter length preferably 1/10 to 3/10 to the total catalyst length in order to control temperature in the upstream catalyst layer and maintain the catalyst activity level in the downstream (Col. 8, lines 17-30). Thus, it would have been obvious in view of Iwaoka and/or Takahata to one having ordinary skill

in the art to modify the apparatus of Heil with a longer length of the catalyst layer on the downstream than the upstream catalyst layer as taught by Iwaoka and/or Takahata in order to control the temperature in the catalyst layers and maintain the sufficient catalytic activity level on the downstream catalyst layer. Regarding claims 12 and 13, it is conventional to provide a second carbon monoxide selection oxidation catalyst layer arranged in parallel and it would have been obvious to do so here to allow the oxidize layers and/or beds to continuously purifying the CO while the other is being regenerated (See USPN 6,309,768).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
January 6, 2004
TD

Glenn Caldarola
Supervisory Patent Examiner
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